This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images, please do not report the images to the Image Problem Mailbox.

We claim:

1. A coated paperboard characterized by having grease, oil and cut resistance, varnish gloss and smoothness, and improved bulk insulation, and tactile properties useful as a base stock for forming substantially rigid food containers having on the coated side a coefficient of kinetic friction of in excess of about 0.2 and a static coefficient of friction in excess of about 0.2 comprising:

a) a paperboard blank having a basis weight suitable for a selected type of food container;

b) optionally a base coat coating layer applied to one surface of the paperboard blank, the base coat coating layer comprising a polymer binder and optionally a pigment;

c) optionally a top coat coating layer applied to the base coat coating layer, the top coat coating layer comprising a mixture of an organic polymer binder and optionally a pigment; and

d) a liquid organic polymeric binder mixture layer including texturizing and insulating agents selected from the group consisting of microspheres, gases, glass beads, hollow glass beads, and mixtures of these applied to the other surface of the blank in a pattern having covered areas and open areas which surface has been heated to expand and cure the liquid texturizing and insulating agent polymeric binder mixture.

2. The coated paperboard of Claim 1 wherein on the coated side , both the coefficient of kinetic friction and the coefficient of static friction are in excess of 0.2 to 2.0 and greater.

3. The coated paperboard of Claim 2 wherein on the coated side the coefficient of kinetic friction is in the range of 0.2 to 1.0 and the coefficient of static friction is in the range of 0.2 to 1.5.

4. The coated paperboard blank of Claim 2 or Claim 3, wherein the base coat coating layer polymer and pigment mixture has substantially the same composition as the composition of the top coat coating layer latex and pigment mixtures and wherein the polymer binder is a latex.

5. The coated paperboard blank of Claim 4 wherein the gases are selected from the group consisting of air, nitrogen, helium, C_1 to C_7 aliphatic hydrocarbons, and a mixture of these.

6. The texture coated disposable paperboard of Claim 4 formed from flat paperboard blanks having two surfaces by printing on one surface of the paperboard with a textured coating covering at least ten percent of such surface wherein the textured coating comprises a liquid polymeric binder mixed with a texturizing agent selected from the group consisting of microspheres, gases, glass beads, and a mixture of these and the paperboard on the texturized side exhibiting a static coefficient of friction of about 0.2 to 2.0 or greater and a kinetic coefficient of friction of about .022 to about 1.0.

7. A texture-coated paperboard container, comprising:

a) a sized paperboard blank having a basis weight suitable for a selected type of food container;

b) a base coat coating layer applied to one surface of the paperboard blank, the base coat coating layer comprising a mixture of a polymer latex and a pigment;

c) a top coat coating layer applied to the base coat coating layer, the top coat coating layer comprising a mixture of an organic polymer latex and a pigment; and

d) a liquid organic polymeric binder mixture layer including texturizing agents selected from the group consisting of microspheres, gases, glass beads, and a mixture of these applied to the other surface of the blank in a pattern having covered areas and open areas which has been heated to expand and cure the liquid texturizing polymeric binder mixture,

wherein, optionally, after heating to expand and cure the texturizing agent/polymeric binder mixture, moisture is introduced into the blank and heat and pressure are applied to form a texture-coated container said container exhibiting on the textured side a static coefficient of friction in excess of 0.22 to 2.00 or greater and a kinetic coefficient of friction of about 0.22 to 1.4.

8. The container of Claim 6 in which the paperboard blank has a weight in the range of about 60 to 400 lbs. per 3000 square foot ream and a caliper in the range of about 0.005 to 0.055 inch.

9. The container of Claim 7 in which sufficient moisture is introduced into the blank to produce a moisture content of about 4.0 to 15.0% by weight.

10. A texture-coated paper container, comprising:

a) a paper blank having a basis weight suitable for a selected type of food container;

b) a base coat coating layer applied to the one surface of the paperboard blank, the base coat coating layer comprising a mixture of a polymer latex and a pigment;

c) a top coat coating layer applied to the base coat coating layer, the top coat coating layer comprising a mixture of an organic polymer latex and a pigment; and

d) a liquid polymeric binder mixture including texturizing agents selected from the group consisting of microspheres, gases, glass beads, and mixtures of these

applied to the other surface of the blank in a pattern having covered areas and open areas which has been heated to expand and cure the liquid texturizing agent/polymeric binder mixture,

e) wherein the paper blank has a weight in the range of about 8 to 40 pounds per ream and a caliper in the range of about .001 to .005 inch,

wherein after heating to expand and cure the liquid texturizing agent/polymeric binder mixture, moisture, optionally, is introduced into the blank and heat and pressure are applied to form a texture-coated container.

11. The container of Claim 7 or Claim 10 in which the expandable microsphere/polymeric binder mixture includes from about 20 to 40% by weight of a mineral filler and from about 0.05 to 0.2% by weight of a rheology modifier.

12 The container of Caim 11 in which the microsphere/polymeric binder mixture includes a colorant.

13. The container of Claim 11 wherein the polymeric binder of the liquid texturizing agent/polymeric binder mixture is chosen from the group consisting of polymers of ethylenically unsaturated monomers, copolymers of ethylenically unsaturated monomers, polymers and copolymers of conjugated dienes, saturated and unsaturated polyesters, polycarbonates, polyethers, polyurethanes, epoxies, ureaformaldehydes, and phenol-formaldehydes.

14. The paperboard of Claim 1 or the container of Claim 10 wherein the polymeric binder of the liquid texturizing/insulating agent/polymeric binder mixture is chosen from the group consisting of copolymers of ethylenically unsaturated monomers such as copolymers of ethylene and propylene, ethylene and styrene, and polyvinyl acetate, styrene and maleic

anhydride, styrene and methyl methacrylate, styrene and ethyl acrylate, styrene and acrylonitrile, methyl methacrylate and ethyl acrylate, methyl methacrylate and acrylonitrile.

15. A coated paperboard characterized by having grease, oil and cut resistance, improved bulk, insulation, and tactile properties useful as a base stock for forming substantially rigid food containers, comprising:

a) a paperboard blank having a basis weight suitable for a selected type of food container;

b) optionally a base coat coating layer applied to one surface of the paperboard blank, the base coat coating layer comprising a mixture of a polymer binder and optionally a pigment;

c) optionally a top coat coating layer applied to the base coat coating layer, the top coat coating layer comprising a mixture of an organic polymer binder and optionally a pigment; and

d) a liquid organic polymeric binder mixture layer including insulating agents selected from the group consisting of microspheres, gases, hollow glass beads, and mixtures of these applied to the other surface of the blank in a pattern having covered areas and open areas which has been heated to expand and cure the liquid insulating agent polymeric binder mixture.

16. The coated paperboard blank of Claim 15, wherein the base coat coating layer polymer binder and pigment mixture has substantially the same composition as the composition of the top coat coating layer polymer binder and pigment mixture.

17. The paperboard of claim 13 wherein the polymeric binder of the liquid insulating coating agent/polymeric binder mixture is chosen from the group consisting of copolymers of ethylenically unsaturated monomers such as copolymers of ethylene and

propylene, ethylene and styrene, and polyvinyl acetate, styrene and maleic anhydride, styrene and methyl methacrylate, styrene and ethyl acrylate, styrene and acrylonitrile, methyl methacrylate and ethyl acrylate, methyl methacrylate and acrylonitrile.

18. The coated paperboard blank of Claim 15 wherein the gases are selected from the group consisting of air, nitrogen, helium, C_1 to C_7 aliphatic hydrocarbons, and a mixture of these.

19. The coated disposable paperboard of Claim 15 formed from flat paperboard blanks having two surfaces by printing on one surface of the paperboard with an insulating coating covering at least ten percent of such surface wherein the insulating coating comprises a liquid polymeric binder mixed with an insulating agent selected from the group consisting of microspheres, gases, hollow glass beads, and a mixture of these.

20. A coated paperboard container, comprising:

a) a paperboard blank having a basis weight suitable for a selected type of food container;

b) optionally a base coat coating layer applied to one surface of the paperboard blank, the base coat coating layer comprising a mixture of a polymer binder and optionally a pigment;

c) optionally a top coat coating layer applied to the base coat coating layer, the top coat coating layer comprising a mixture of an organic polymer binder and optionally a pigment; and

d) a liquid organic polymeric binder mixture layer including insulating agents selected from the group consisting of microspheres, gases, hollow glass beads, and a mixture of these applied to the other surface of the blank in a pattern having covered areas

and open areas which has been heated to expand and cure the liquid texturizing polymeric binder mixture,

wherein, optionally, after heating to expand and cure the insulating agent/polymeric binder mixture, moisture is introduced into the blank and heat and pressure are applied to form a texture-coated container.

21. The paperboard of Claim 1 wherein, prior to the printing of the texturizing and insulating agent and the binder, the paperboard has been coated with a binder and optionally an inorganic or organic pigment.

22. A textured article of manufacture having improved insulating properties formed from the textured paperboard of Claim 1.

23. The textured article of manufacture of Claim 22 in the form of a textured container having the static coefficient of friction of about 0.2 to 2.0 and greater and a kinetic coefficient of friction of about 0.2 to 2.0 or greater.

24. The textured article of manufacture of Claim 22 in the form of a textured plate having a static coefficient of friction of about 0.2 to 2.0 or greater and a kinetic coefficient of friction of about 0.2 to 1.8.

25. The textured plate of Claim 22 in the form of a textured, compartmented plate having a static coefficient of friction of aobut 0.2 to 2.0 and a kinetic coefficient of friction of about 0.2 to 1.5.

26. The textured article of manufacture of Claim 22 in the form of a textured bowl having a static coefficient of friction of about 0.2 to 2.0 or greater and a kinetic coefficient of about 0.2 to 1.5.

27. The textured article of manufacture of Claim 22 in the form of a textured canister having a static coefficient of friction of about 0.2 to 2.0 and a kinetic coefficient of friction of about 0.2 to 1.5.

28. The textured article of manufacture of Claim 22 in the form of a textured, rectangular take out container having a static coefficient of friction of about 0.2 to 2.0 and a kinetic coefficient of friction of about 0.2 to 1.5.

29. The textured article of manufacture of Claim 22 in the form of a textured hamburger clam shell having a static coefficient of friction of about 0.2 to 2.0 and a kinetic coefficient of friction of about 0.2 to 1.5.

30. The textured article of manufacture of Claim 22 in the form of a textured French fry sleeve having a static coefficient of friction of about 0.2 to 2.0 and a kinetic coefficient of friction of about 0.2 to 1.5.

31. The textured article of manufacture of Claim 22 in the form of a textured food bucket having a static coefficient of friction of about 0.2 to 2.0 and a kinetic coefficient of friction of about 0.2 to 1.5.

32. A textured hamburger wrap formed from the printed, texturized paper of Claim 10 wherein the sized paper blank has a basis weight of about 10 to 60.

33. The paperboard of Claim 1 wherein the polymeric binder has a glass transition temperature of about -30°C to + 30°C

34. The paperboard of Claim 33 wherein the polymeric binder has a glass transition temperature of about -10°C to about +10°C.

35. The polymeric binder of Claim 34 wherein the binder is selected from the group consisting of styrene acrylic polymer, and a terpolymer emulsion of vinyl chloride, ethylene and vinyl acetate having a glass transition temperature of 0° to 3°C.

36. The polymeric binder of Claim 33 wherein the binder is selected from the group consisting of Acronal S504, Airflex 456, Styronal NX4515X, GenQRP 176, and mixtures of these.

37. The coated container of Claim 7 or Claim 10 wherein the polymeric binder has a glass transition temperature of about -30°C to + 30°C

38. The paperboard of Claim 37 wherein the polymeric binder has a glass transition temperature of about -10°C to about +10°C.

39. The coated container of Claim 37 wherein the binder is selected from the group consisting of styrene acrylic polymer, and a terpolymer emulsion of vinyl chloride, ethylene and vinyl acetate having a glass transition temperature of about 0° to 3°C.

40. The coated container of Claim 37 wherein the binder is selected from the group consisting of Acronal S504, Airflex 456, Styronal NX4515X, GenQRP 176, and mixtures of these.

41. A method of making a texture-coated container comprising:

a) providing a paperboard blank with two surfaces;

b) optionally applying a protective coating to one surface of the blank;

c) printing a liquid polymeric binder mixture including texturizing agents selected from the group consisting of microspheres, gases, glass beads, and mixtures of these on the other surface of the blank in a pattern having covered areas and open areas; the covered and open areas optionally being controllled to produce containers having a static coefficient of frictioin of about 0.22 to about 2.0 and a kinetic coefficient of friction of about 0.22 to 1.5;

d) heating to expand and cure the textured surface coating;

e) optionally introducing moisture into the blank; and

f) optionally applying heat and pressure to the top- and bottom-coated and moistened blank to make a texture-coated container.

42. The method of Claim 41 in which the paperboard blank has a weight in the range of about 10 to 400 lbs. per ream and a caliper in the range of about 0.001 to 0.055 inch.

43. The method of Claim 41 in which the paperboard blank has a weight in the range of about 60 to 400 lbs. per ream and a caliper in the range of about 0.008 to 0.050. inch.

44. The method of Claim 41 in which sufficient moisture is introduced into the blank to produce a moisture content of about 4.0 to 15.0% by weight.

45. The method of Claim 41 in which sufficient moisture is introduced into the blank to produce a moisture content of about 9.0 to 11.0% by weight.

46. A method of making a coated container having enhanced bulk and insulation properties comprising:

a) providing a paperboard blank with two surfaces;

b) optionally applying a protective coating to one surface of the blank;

c) printing a liquid polymeric binder mixture including insulation agents selected from the group consisting of microspheres, gases, hollow glass beads, and mixtures of these on the other surface of the blank in a pattern having covered areas and open areas;

d) heating to expand and cure the textured surface coating;

e) optionally introducing moisture into the blank; and

f) optionally applying heat and pressure to the top- and bottom-coated and moistened blank to make a coated container having enhanced bulk and insulation properties.

47. The method of Claim 46 in which the paperboard blank has a weight in the range of about 10 to 400 lbs. per 3000 square foot ream, a caliper in the range of about 0.001 to 0.055 inch, and the protective coating is applied to one surface of the blank and heat and pressure are applied to the top and bottom coated and moistened blank to make a coated container having enhanced insulation and bulk properties.

48. The method of Claim 47 in which the paperboard blank has a weight in the range of about 60 to 400 lbs. per 3000 square foot ream and a caliper in the range of about 0.008 to 0.050. inch.

49. The method of Claim 47 in which the protective coating comprises successive layers first of sizing, second of clay particles and third of nitrocellulose lacquer.

50. The method of Claim 41 in which the moisture is introduced into the blank by applying a moistening/lubricating solution to the bottom of the blank with a roller.

51. The method of Claim 41 in which the moisture is introduced into the blank by applying a moistening/lubricating solution to the bottom of the blank with a brush.

52. The method of Claim 41 in which the moisture is introduced into the blank by applying a moistening/lubricating solution to the bottom of the blank by spraying.

53. The method of Claim 50 in which the moistening/lubricating solution contains about 0 to 39 percent by weight polyethylene wax and ethoxylated surfactant, with the balance being water.

54. The method of Claim 41 in which the liquid microsphere/polymeric binder coating comprises from about 1 to 50% by weight of expandable microspheres.

55. The method of Claim 41 in which the liquid microsphere/polymeric binder coating comprises from about 10 to 30% by weight of expandable microspheres.

56. The method of Claim 41 in which a sufficient amount of the expandable microsphere/polymeric binder mixture is applied to produce, after heating, a textured coating with a caliper ranging from about .001 to .015 inch.

57. The method of Claim 41 in which a sufficient amount of the expandable microsphere/polymeric binder mixture is applied to produce, after heating, a textured coating with a caliper ranging from about .005 to .010 inch.

58. The method of Claim 41 in which from about 10% to 90% of the surface area of the textured surface of the blank is covered with the polymeric binder mixture and the texturizing agent.

59. The method of Claim 46 in which from about 10% to 90% of the surface area of the insulation coated surface of the blank is coated with the polymeric mixture and the insulation agent.

60. The method of Claim 41 in which from about 30% to 50% of the surface area of the textured surface of the blank is covered with the polymeric binder and the texturizing agent mixture.

61. The method of Claim 41 in which the microsphere/polymericbinder mixture includes from about 0 to 50% by weight of a mineral filler and from about 0 to 0.5% by weight of a rheology modifier.

62. The method of Claim 41 in which the expandable microsphere/polymeric binder mixture includes from about 20 to 40% by weight of a mineral filler and from about 0.05 to 0.2% by weight of a rheology modifier.

63. The method of Claim 60 wherein the texturizing/insulation agent is selected from the group consisting of microspheres, gases, glass beads, hollow glass beads, and mixtures of these.

64. The method of Claim 63 wherein gases are selected from the group consisting of air, nitrogen, helium, C_1 to C_7 hydrocarbons, and mixtures of these.

65. The method of Claim 41 in which the microsphere/polymeric binder mixture includes a colorant.

66. The method of Claim 41 in which after the liquid microsphere/polymeric binder is applied, the blank is heated to about 200 to 500°F for a period sufficient to expand the microspheres and cure the polymeric binder.

67. The method of Claim 41 in which after the liquid polymeric binder and texturizing agent mixture is applied, the blank is heated to about 225 to 300°F for a period sufficient to expand the microspheres and cure the polymeric binder.

68. The method of Claim 67 in which the blank is heated to about 200 - 400°F in the final step.

69. The method of Claim 41 in which pressure of about 300 to 1500 psi is applied to the blank in the final step.

70. The method of Claim 41 in which the moisture is introduced into the blank after applying coatings to the printed surface of the blank.

71. A method of making a texture-coated container comprising:

a) providing a paperboard blank with first and second surfaces;

b) applying a protective coating to the first surface of the blank;

c) applying a microsphere/polymeric binder mixture containing about 1-30% by weight expandable microspheres to the other surface in a pattern having covered

areas and open areas in which about 10 to 95% of the surface area of the second surface of the blank is covered; the covered and open areas being controlled to produce containers having a coefficient of static friction on the textured side of about 0.2 to about 2.0 and a kinetic coefficient of friction of about 0.26 to 1.5.

d) heating to expand and cure the second surface coating;

e) introducing moisture into the blank to bring the level of moisture to about 9 to 11 percent by weight; and

f) applying heat and pressure to the first-and second-coated moistened blank to make a texture-coated container.

72. A texture-coated container comprising a paperboard blank prepared from the paperboard of claim 1 which has been shaped into the form of a container in which the other surface of the container has a screen printed patterned coating of expanded microspheres in a cured polymeric binder, the patterned coating covering from about 10 to 90% of the other surface of the container.

73. The texture coated container of Claim 72 in which the patterned coating covers about 30 to 50% of the other surface of the container.

74. The method of Claim 41 wherein the polymeric binder of the liquid microspheres/polymeric binder mixture is chosen from the group consisting of polymers of ethylenically unsaturated monomers, copolymers of ethylenically unsaturated monomers, polymers and copolymers of conjugated dienes, saturated and unsaturated polyesters, polycarbonates, polyethers, polyurethanes, epoxies, ureaformaldehydes, and phenol-formaldehydes.

75. The method of Claim 74 wherein the polymeric binder of the liquid microspheres/polymeric binder mixture is chosen from the group consisting of copolymers

of ethylene and propylene, ethylene and styrene, and polyvinyl acetate, styrene and maleic anhydride, styrene and methyl methacrylate, styrene and ethyl acrylate, styrene and acrylonitrile, methyl methacrylate and ethyl acrylate, methyl methacrylate and acrylonitrile.

76. The method of Claim 74 wherein the polymeric binder is a styrene acrylic derivative or a terpolymer emulsion of vinyl chloride ethylene and vinyl acetate having a glass transition temperature of about 0° to 3°C.

77. The method of Claim 41 wherein the polymeric binder of the liquid microspheres/polymericbinder mixture is selected from the group consisting of polyethylene, polypropylene, polybutenes, polystyrene, poly (a-methyl styrene), polyvinyl chloride, polyvinyl acetate, polymethyl methacrylate, polyethyl acrylate polyacrylonitrile, and a mixture of these.

78. The method of Claim 46 wherein at least 5 pounds of the dry insulating coating are applied per fully coated 3000 square foot ream.

79. The method of Claim 78 wherein about 5 to 50 pounds of the insulating coating are applied per fully coated 3000 square foot ream.

80. The method of Claim 41 wherein the polymeric binder is selected from the group consisting of Acronal S504, Airflex 456, Styronal NX4515X, GenQRP 576, and mixtures of these.

81. The coated paperboard of Claim 1 or Claim 15 wherein prior to printing the texturizing and insulating agent and the binder on the paperboard surface the paperboard comprises:

(a) predominantly cellulosic fibers;

(b) bulk and porosity enhancing additive interspersed with said cellulosic fibers in a controlled distribution throughout the thickness of said paperboard web; and

(c) size press applied binder coating, optionally including a pigment adjacent both surfaces of the paperboard and penetrating into the board to a controlled extent; the overall fiber weight "w" of the web being at least about 40 lbs./3000 square foot ream,

(i) the distribution of the bulk and porosity enhancing additive throughout the thickness of the paperboard, and

(ii) the penetration of the size press applied pigment coating into the board, both being controlled to simultaneously produce at a fiber mat density of 3, 4.5, 6.5, 7, 8.3, and 9 pounds per 3000 square foot ream at a 0.001 inch thickness respectively:

(A) a GM Taber stiffness of at least about $0.00716w^{2.63}$ grams-centimeter / fiber mat density$^{1.63}$; and

(B) at a fiber mat density of about 3 to 9 pounds per 3000 square foot ream at a fiberboard thickness of 0.001 inch, a GM tensile stiffness of at least 1890 + 24.2w pounds per inch.

82. The paperboard of Claim 81 wherein at a fiber mat density of 3, 4.5, 6.5, 7, 8.3, and 9 pounds per 3000 square foot ream at a 0.001 inch thickness respectively, the GM Taber stiffness is at least $0.00501w^{2.63}$ grams-centimeter / fiber mat density$^{1.63}$, and the GM tensile stiffness is at least 1323 + 24.2w pounds per inch.

83. The paperboard web of Claim 82 wherein at a fiber mat density of 3, 4.5, 6.5, 7, and 8.3 pounds per 3000 square foot ream at a 0.001 inch thickness respectively, the GM Taber stiffness is at least $0.0084w^{2.63}$ grams-centimeter / fiber mat density$^{1.63}$, $0.00043w^{2.63}$ grams-centimeter / fiber mat density$^{1.63}$, $0.00024w^{2.63}$ grams-centimeter / fiber mat density$^{1.63}$, $0.00021w^{2.63}$ grams-centimeter /fiber mat density$^{1.63}$, and $0.00016w^{2.63}$

grams-centimeter /fiber mat density$^{1.63}$, and the GM tensile stiffness is at least 1323 + 24.2w pounds per inch.

84. The paperboard web of claim 83 wherein at a fiber mat density of 3, 4.5, 6.5, and 7 pounds per 3000 square foot ream at a 0.001 inch thickness respectively, the GM Taber stiffness is at least $0.0084w^{2.63}$ grams-centimeter / fiber mat density$^{1.63}$, $0.00043w^{2.63}$ grams-centimeter /fiber mat density$^{1.63}$, $0.00024w^{2.63}$ grams-centimeter / fiber mat density$^{1.63}$, and $0.00021w^{2.63}$ grams-centimeter / fiber mat density$^{1.63}$, and the GM tensile stiffness is at least 1323 + 24.2w pounds per inch.

85. The paperboard of Claim 81 wherein a size press binder applied optionally including a pigment is at least one pound for each 3000 square foot ream.

86. The paperboard of claim 85 wherein the amount of size press binder applied, optionally including a pigment, is at least six pounds for each 3000 square foot ream.

87. The paperboard of Claim 86 wherein the amount of size press binder applied optionally including a pigment is about 15-30 pounds for each 3000 square foot ream.

88. The paperboard of Claim 81 wherein the percentage by weight of the pigment to the binder is about 0-80.

89. The paperboard of Claim 88 wherein the binder is selected from the group consisting of aliphatic acrylate acrylonitrile styrene copolymers, n-butyl acrylate acrylonitrile styrene copolymer, n-amyl acrylate acrylonitrile styrene copolymer, n-propyl acrylate acrylonitrile styrene copolymer, n-ethyl acrylate acrylonitrile styrene copolymer, aliphatic acrylate styrene copolymers, n-butyl acrylate styrene copolymer, n-amyl acrylate styrene copolymer, n-propyl acrylate styrene copolymer, n-ethyl acrylate styrene copolymer, cationic starch, anionic starch, amphoteric starch, starch latex copolymers, animal glue, gelatin, methyl cellulose, carboxymethylcellulose, polyvinyl alcohol, ethylene-

vinyl acetate copolymer, vinyl acetate-acrylic copolymer, styrene-butadiene copolymer, ethylene-vinyl chloride copolymer, vinyl acetate polymer, vinyl acetate-ethylene copolymer, acrylic copolymer, styrene-acrylic copolymer, stearylated melamine, hydrophilic epoxy esters, and mixtures of these.

90. The paperboard of Claim 88 wherein the pigment is selected from the group consisting of a clay, chalk, barite, silica, talc, bentonite, glass powder, alumina, titanium dioxide, graphite, carbon black, zinc sulfide, alumina silica, calcium carbonate, and mixtures of these.

91. The paperboard of Claim 90 wherein the pigment is kaolin clay.

92. The paperboard of Claim 81 wherein the bulk and porosity enhancing additive is selected from the group consisting of expanded or unexpanded uncoated microspheres, expanded or unexpanded coated microspheres, expanded or unexpanded microspheres coated discontinuously and mixtures of expanded and unexpanded coated, uncoated, and discontinuously coated microspheres.

93. The paperboard of Claim 92 wherein the microspheres are attached to the fiber prior to the formation of the embryonic web.

94. The paperboard of Claim 81 wherein the cellulose fiber is replaced in whole or in part with a synthetic fiber.

95. The paperboard of Claim 94 wherein the synthetic fiber is selected from the group consisting of polyolefins, polyethylenes, polypropylenes, and polyesters.

96. The paperboard of Claim 81 wherein a retention aid is utilized.

97. The paperboard of Claim 96 wherein the retention aid is selected from the group consisting of coagulation agents, flocculation agents, and entrapment agents.

98. The paperboard of Claim 97 wherein the coagulation agents are selected from the group consisting of: inorganic salts, alum, aluminum chloride, poly aluminum chloride and synthetic or inorganic polymers, poly (diallyldimethylammonium chloride), poly (dimethylamine)-co-epichlorohydrin, polyethylenimine, poly (3-butenyltrimethyl ammonium chloride), poly (4-ethenylbenzyltrimethylammonium chloride), poly (2,3-epoxypropyltrimethylammonium chloride), poly (5-isoprenyltrimethylammonium chloride), poly (acryloyloxyethyltrimethylammonium chloride), polysulfonium compounds, and polymers prepared from the adduct of 2-chloromethyl-1,3-butadiene and a dialkylsulfide and mixtures of these.

99. The paperboard of Claim 97 wherein the coagulation agents are selected from the group consisting of polyamines which are the reaction products of the following amines: ethylenediamine, diethylenetriamine, triethylenetetraamine, dialkylamines, with bis-halo, bis-epoxy, or chlorohydrin compounds and mixtures of these.

100. The paperboard of Claim 97 wherein the coagulation agent is the reaction product of ethylenediamine, diethylenetriamine, triethylenetetraamine, dialkylamines with 1-2 dichloroethane, 1,5-diepoxyhexane, or epichlorohydrin, and mixtures of these.

101. The paperboard of Claim 97 wherein the coagulation agents are polymers comprising the guanidine moiety.

102. The paperboard of Claim 101 wherein the coagulation agent is the polymeric reaction product of guanidine and formaldehyde or polyamines.

103. The paperboard of Claim 97 wherein the coagulation agent is poly (diallyldimethylammoniumchloride) having a molecular weight in excess of ninety thousand.

104. The paperboard of Claim 98 wherein the coagulation agent is a polyethylenimine having a molecular weight of about forty thousand to five hundred thousand.

105. The paperboard of Claim 98 wherein the flocculation agent comprises a dual polymer selected from the group consisting of anionic starches, carboxymethylcellulose, anionic gums, poly (acrylamide)-co-acrylic acid, colloidal silica, bentonite clay, and mixtures of these.

106. The paperboard of Claim 98 wherein the flocculation agent is polyethylenimine having a molecular weight of about five hundred thousand to two million.

107. The paperboard of Claim 98 wherein the flocculation agent is selected from the group consisting of: cationic starches, cationic polyacrylamides, poly (acrylamide)-co-diallyldimethylammoniumchloride, poly (acrylamide)-co-acryloyloxyethyl, trimethylammonium chloride, cationic gums, chitosan and mixtures of these.

108. The paperboard of Claim 98 wherein the flocculation agent is a nitrogen containing organic polymer having a molecular weight in excess of one hundred thousand.

109. The paperboard of Claim 108 wherein the nitrogen containing organic polymer is selected from the group consisting of polyacrylamides, acrylamide-acrylate polymers, and cationic acrylamide copolymers, polyethylenimine, or mixtures of these having a molecular weight in the range of five hundred thousand to thirty million.

110. The paperboard of Claim 109 wherein the organic polymer has a molecular weight of about ten to twenty million.

111. The paperboard of Claim 97 wherein the entrapment agent is selected from the group consisting of high molecular weight anionic polyacrylamides, high molecular

weight polyethyleneoxides and reaction products of polyethyleneoxides and phenolic resins.

112. The paperboard of Claim 96 wherein the retention aid is a micro particle colloid which combines the microspheres and the cellulosic fibers prior to web formation.

113. The paperboard of Claim 112 wherein the micro particle colloid is selected from the group of silica, bentonite clay, alumina, talc, calcium carbonate, zinc sulfide, titanium dioxide, an organic pigment, and a mixture of these.

114. The paperboard of Claim 92 wherein the expanded or unexpanded microspheres are coated with an inorganic pigment or a retention aid selected from the group consisting of coagulation agents, flocculation agents, entrapment agents, and mixtures of these.

115. The paperboard of Claim 114 wherein the microspheres are coated with an inorganic pigment selected from the group consisting of bentonite clay, kaolin clay, clay, talc, barium sulfate, alumina, silica, titanium dioxide, zinc oxide, cotton, cellulosic fiber, graphite, carbon black, colloidal silica, and mixtures of these.

116. The paperboard of Claim 114 wherein the microspheres are coated with polyacrylamides, poly (acrylamide)-co-acrylic acid, poly (acrylamide)-co-diallyldimethyl ammonium chloride, poly (acrylamide)-co-acryloxyloxyethyl trimethylammonium chloride, starch, cationized starch, anionic starch, carboxymethylcellulose, anionic gums, polyethylenimine, poly (diallyldimethylammonium chloride) acrylamide acrylate polymers, cationic acrylamide copolymers, and mixtures of these.

117. The paperboard of Claim 81 comprising a plurality of microspheres selected from the group of expanded and unexpanded microspheres and a mixture of these in a proportion of between about 10 lbs. to about 400 lbs. per ton of fiber and a retention aid in

an amount sufficient to retain a sufficient portion of the microspheres in all layers within the paperboard.

118. The paperboard of Claim 117 wherein the microspheres have a mean diameter ranging between about 0.5 to 60 microns in the unexpanded state and have a maximum expansion of between about 4 and 9 times the mean diameters.

119. The paperboard of Claim 117 wherein the retention aid is selected from the group consisting of Nalco 8674, Nalco 8678, Nalco 625, Cytec Accurac 120, Accurac 181, Microform 2321, Microform BCS, Reten 203, Polymin PR 971L, and a mixture of these.

120. The paperboard of Claim 117 wherein the retention aid is diallyldimethyl ammonium chloride polymer having a molecular weight in excess of ninety thousand.

121. The paperboard of Claim 117 wherein the retention aid is polyethylenimine having a molecular weight of about forty thousand to two million.

122. The paperboard of Claim 121 wherein the polyethylenimine has a molecular weight of about five hundred thousand to two million.

123. The paperboard of Claim 117 wherein the retention aid is selected from the group consisting of polyacrylamides, acrylamide-acrylate polymers, cationic acrylamide copolymers, and mixtures of these having a molecular weight in the range of one hundred thousand to thirty million.

124. The paperboard of Claim 123 wherein the retention aid has a molecular weight of about ten to twenty million.

125. The paperboard of Claim 81 wherein, prior to the printing of the texturizing and insulating agent and the binder, the paperboard has been coated with a binder and optionally an inorganic or organic pigment.

126. A textured, insulated article of manufacture having improved insulating properties formed from the textured paperboard of Claim 81.

127. The textured, insulated article of manufacture of Claim 126 in the form of a textured, insulated container.

128. The textured, insulated article of manufacture of Claim 126 in the form of a textured, insulated plate.

129. The textured, insulated plate of Claim 128 in the form of a textured, insulated compartmented plate.

130. The textured, insulated article of manufacture of Claim 126 in the form of a textured, insulated bowl.

131. The textured, insulated article of manufacture of Claim 126 in the form of a textured, insulated canister.

132. The textured, insulated article of manufacture of Claim 126 in the form of a textured, insulated, rectangular take out container.

133. The textured, insulated article of manufacture of Claim 126 in the form of a textured, insulated hamburger clam shell.

134. The textured, insulated article of manufacture of claim 126 in the form of a textured, insulated French fry sleeve.

135. The textured, insulated article of manufacture of Claim 126 in the form of a textured, insulated food bucket.

136. The article of manufacture of Claim 20 or 126 in the form of an insulated cup.

137. The insulated cup of Claim 136 having an inner and an outer surface which when filled with a liquid at 190° F exhibits thermal insulative properties such that at room temperature and one atmosphere pressure the textured part of the outer surface does not reach a temperature of about 145°F in less than forty seconds.

138. The insulated article of manufacture of Claim 20 in the form of an insulated container.

139. The insulated article of manufacture of Claim 20 in the form of an insulated plate.

140. The insulated plate of Claim 139 in the form of an insulated compartmented plate.

141. The insulated article of manufacture of Claim 20 in the form of an insulated bowl.

142. The insulated article of manufacture of Claim 21 in the form of an insulated canister.

143. The insulated article of manufacture of Claim 20 in the form of an insulated, rectangular take out container.

144. The insulated article of manufacture of Claim 20 in the form of an insulated hamburger clam shell.

145. The insulated article of manufacture of Claim 19 in the form of an insulated French fry sleeve.

146. The insulated article of manufacture of Claim 20 in the form of an insulated food bucket.

147. The insulated article of manufacture of Claim 20 comprising a microwave susceptor layer.

148. The insulated article of Claim 147 in the form of a food container.